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AMENDMENT
Serial No. 09/557,119

YOR9-2000-0023-US1

IN THE CLAIMS:

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1 1. (Amended) A programmable alarm clock system for waking a sleeper during a
2 selected period of sleep, said programmable alarm clock system comprising:
3 a sleep analyzing server;
4 at least one sleep activity sensor attachable to a head of a sleeper;
5 a receiver receiving sleep activity signals from each at least one said sleep
6 activity sensor;
7 a local computer receiving a wake up time and received said sleep activity
8 signals and sending said received sleep activity signals remotely to said sleep analyzing
9 server; and
10 a remotely triggered local alarm device sounding a wake up alarm responsive to
11 a determination from said local computer that said sleeper should be awoken.

1 2. (Original) A programmable alarm clock system as in claim 1, wherein said sleep
2 activity is brain activity and said sleep analyzing server analyzes received brain activity
3 signals and identifies periods of slow wave sleep.

1 3. (Original) A programmable alarm clock system as in claim 1, wherein said sleep
2 activity is brain activity and said sleep analyzing server analyzes received brain activity
3 signals and identifies periods of REM sleep and non-REM sleep.

1 4. (Original) A programmable alarm clock system as in claim 1, wherein said at least
2 one sensor measures brain activity using electroencephelography.

1 5. (Original) A programmable alarm clock system as in claim 1, wherein said at least
2 one sensor measures brain activity using polysomnography.

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2 6. (Amended) A programmable alarm clock system as in claim 1, wherein ~~said activity~~
3 ~~is brain activity and~~ said at least one sensor is a plurality of sensors measuring brain
4 activity and in wireless communication with said local computer.

1 7. (Amended) A programmable alarm clock system as in claim 1, wherein said at least
2 one sleep activity sensor is ~~eye movement and~~ one or more eyelid sensors are attached
3 to said sleeper's eyelids measuring said eye movement, said receiver receiving sensor
4 signals from said eyelid sensors.

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cont.
1 8. (Amended) A programmable alarm clock system as in claim 1, wherein said local
2 computer is further provided with a selected sleep activity, the sleep analyzing server
3 sending information about identified periods of said selected sleep activity to said local
4 computer and said local computer determines from received said information when to
5 trigger said wake up alarm relative to said wake up time.

1 9. (Previously Amended) A programmable alarm clock system as in claim 8, wherein
2 when said local computer determines that said sleeper is in an identified period of said
3 selected sleep activity at said wake up time, said local computer triggers said wake up
4 alarm.

1 10. (Previously Amended) A programmable alarm clock system as in claim 9, wherein
2 when said local computer determines that said sleeper is in an other sleep activity period
3 identified as having a sleep activity other than said selected sleep activity at said wake
4 up time, said local computer triggers said wake up alarm at an end to said other sleep
5 activity period.

1 11. (Previously Amended) A programmable alarm clock system as in claim 9, wherein
2 when said local computer determines that said sleeper is in an other sleep activity period

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3 identified as having a sleep activity other than said selected sleep activity at said wake
4 up time, said local computer postpones triggering said alarm until a next selected sleep
5 period.

1 12. (Previously Amended) A programmable alarm clock system as in claim 10, wherein
2 when said local computer determines that said sleeper is in an other sleep activity period
3 identified as having a sleep activity other than said selected sleep activity at said wake
4 up time, if said local computer determines that the next selected sleep activity period is
5 expected to occur beyond a selected margin, said local computer triggers said wake up
6 alarm.

1 13. (Original) A programmable alarm clock system as in claim 8, wherein said selected
2 sleep activity is REM sleep.

1 14. (Original) A programmable alarm clock system as in claim 8, wherein said selected
2 sleep activity is non-REM sleep.

1 15. (Previously Amended) A programmable alarm clock system as in claim 6, wherein
2 the server comprises:
3 a receiving module receiving sleep activity;
4 a signal analyzer charting sleep data and identifying sleep periods as being either
5 selected activity sleep periods or other activity sleep periods;
6 a signal labeler labeling selected activity sleep periods and other activity sleep
7 periods; and
8 a sender sending labeled said charts to the local computer.

1 16. (Previously Amended) A programmable alarm clock system as in claim 15, further
2 comprising:

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3 a signal processing unit receiving analog signals representative of said sleep
4 activity and providing digital sleep data to the signal analyzer responsive to said analog
5 signals.

1 17. (Previously Amended) A programmable alarm clock system as in claim 16, further
2 comprising:

3 one or more sleep activity sensors attached to the head of said sleeper, each of
4 said one or more sensors sending sleep activity signals to said receiving module.

1 18. (Previously Amended) A programmable alarm clock system as in claim 17, wherein
2 at least one of said one or more sleep activity sensors is sensing brain activity.

1 19. (Original) A programmable alarm clock system as in claim 18, wherein the signal
2 analyzer identifies sleep periods based upon selected brain activity prototypes.

1 20. (Previously Amended) A programmable alarm clock system as in claim 17, wherein
2 at least one of said one or more sense activity sensors senses eye movement.

1 21. (Previously Amended) A method of operating a programmable alarm clock, said
2 method comprising the steps of:

- 3 a) receiving sleep activity signals;
4 b) digitizing said sleep activity signals;
5 c) analyzing said digitized sleep activity signals to identify selected sleep
6 activity periods and other sleep activity periods;
7 d) waiting for a designated wake up time;
8 e) determining whether said sleep activity signals indicate that a sleeper is
9 in a period of said selected sleep activity or a period of other sleep activity at said
10 designated wake up time; and

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11 f) sounding an alarm at said designated wake up time if said sleep activity
12 signals indicate said selected sleep activity.

1 22. (Previously Amended) A method of operating a programmable alarm clock as in
2 claim 21, when said sleep activity signals indicate said other sleep activity period at said
3 wake up time, said method further comprising the steps of:

- 4 g) determining an alarm time to sound said alarm; and
5 h) sounding said alarm at said alarm time.

1 23. (Previously Amended) A method of operating a programmable alarm clock as in
2 claim 22, wherein the determining step (g) comprises the steps of:

- 3 i) determining whether a wait margin has been selected, the alarm time
4 being set to said designated wake up time when no wait margin has been selected;
5 ii) setting the alarm time when said next expected selected sleep activity
6 period is within the wait margin; and
7 iii) if said other sleep activity continues beyond said wait margin, setting
8 said alarm at the end of said wait margin.

1 24. (Original) A method of operating a programmable alarm clock as in claim 23,
2 wherein the sleep activity signals received in the receiving step (a) are brain activity
3 signals and the brain activity signals are sent to a remotely connected server.

1 25. (Original) A method of operating a programmable alarm clock as in claim 24,
2 wherein the analyzing step (c) comprises the steps of:

- 3 i) creating a prototype chart of said digitized brain activity signals; and
4 ii) labeling periods in said prototype chart as being selected sleep activity
5 periods and other sleep activity periods.

1 26. (Amended) A method of operating a programmable alarm clock as in claim 25,
2 wherein said labeled prototype chart is sent to a local computer.

1 27. (Previously Amended) A method of operating a programmable alarm clock as in
2 claim 26, wherein in the step (e) of determining whether sleep activity signals indicate
3 that the sleeper is in the selected sleep activity period, said local computer interrogates
4 the labeled prototype chart, determining therefrom whether the designated wake up time
5 is in one of the selected sleep activity periods.

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part.
1 28. (Original) A method of operating a programmable alarm clock as in claim 27,
2 wherein the local computer sends a trigger to an alarm clock in the steps (f) and (h) of
3 sounding the alarm, the alarm clock sounding the alarm responsive to said trigger.

1 29. (Original) A method of operating a programmable alarm clock as in claim 28,
2 wherein the selected sleep activity is non-REM sleep.

1 30. (Original) A method of operating a programmable alarm clock as in claim 28,
2 wherein the selected sleep activity is REM sleep.

1 31. (Original) A method of operating a programmable alarm clock as in claim 28,
2 wherein the selected sleep activity is slow wave sleep.

1 32. (Previously Amended) A computer program product for operating a programmable
2 alarm clock system, said computer program product comprising a computer usable
3 medium having computer readable program code thereon, said computer readable
4 program code comprising:

5 computer readable program code means for digitizing sleep activity signals;
6 computer readable program code means for analyzing digitized said sleep
7 activity signals to identify selected sleep periods and non-selected sleep periods;

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8 computer readable program code means for determining whether to send a
9 trigger responsive to a designated wake up time is in a selected sleep period or non-
10 selected sleep period; and
11 computer readable program code means for sounding an alarm responsive to
12 said trigger.

1 33. (Previously Amended) A computer program product for operating a programmable
2 alarm clock system as in claim 32, wherein said computer readable program code means
3 for determining an alarm time comprises:

4 computer readable program code means for determining whether a wait margin
5 has been selected, a trigger time being set to said designated wake up time when no wait
6 margin has been selected;

7 computer readable program code means for setting said trigger time as a next
8 expected selected sleep activity period when said next expected selected sleep activity
9 period is determined to be expected to occur within the wait margin; and

10 computer readable program code means for setting said trigger time at the end of
11 said wait margin, when a non-selected sleep activity period is expected to extend
12 through said wait margin.

1 34. (Original) A computer program product for operating a programmable alarm clock
2 system as in claim 33, further comprising:

3 computer readable program code means for forwarding received sleep activity
4 signals to a remotely connected server.

1 35. (Previously Amended) A computer program product for operating a programmable
2 alarm clock system as in claim 34, wherein the sleep activity signals are brain activity
3 signals and said computer readable program code means for analyzing digitized brain
4 activity comprises:

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5 computer readable program code means for creating a prototype chart of said
6 digitized brain activity signals;
7 computer readable program code means for labeling periods in said prototype
8 chart as being selected sleep periods and non-selected periods; and
9 computer readable program code means for sending each labeled said prototype
10 chart to a local computer.

1 36. (Previously Amended) A computer program product for operating a programmable
2 alarm clock system as in claim 35, wherein said computer readable program code means
3 for sounding said alarm comprises:

4 computer readable program code means for causing said local computer to send
5 said trigger to a local alarm device.

1 37. (Previously Amended) A computer program product for operating a programmable
2 alarm clock system as in claim 34, wherein said sleep activity signals are indicated by
3 eye movement.

1 38. (Previously Amended) A computer program product for operating a programmable
2 alarm clock system as in claim 37, wherein said selected sleep activity is REM sleep.

1 39. (Previously Amended) A computer program product for operating a programmable
2 alarm clock system as in claim 37, wherein said selected sleep activity is non-REM
3 sleep.

1 40. (Previously Amended) A computer program product for operating a programmable
2 alarm clock system as in claim 37, wherein said selected sleep activity is slow wave
3 sleep.